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The employment of Aboriginal Australians in the labour market

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- to identify and analyse the factors affecting Aboriginal participation in the labour force; and
- to assist in the development of government strategies aimed at raising the level of Aboriginal participation in the labour force and at the stimulation of Aboriginal economic development.

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ABSTRACT

This paper is the second of two examining the effect of Aboriginality on employment and labour market status using data from the 1986 Population Census. It begins by presenting the data from the full-count of the 1986 Census showing that Aboriginal men and women had a lower employment rate (employment to population ratio) than non-Aboriginal men and women in each State and Territory and in each section-of-State. The results of a formal analysis of employment status using data from the 1 per cent sample of the Census show that there is a statistically significant negative effect of Aboriginality on the probability of employment. Most of the difference in the employment probabilities between Aborigines and non-Aborigines cannot be explained by the standard human capital variables but rather by factors associated with Aboriginality. The implications of these results for Aboriginal employment policy are considered in the conclusion.

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In October 1987 the Labor Government launched the Aboriginal Employment Development Policy (AEDP) based on four major policy goals to be achieved by the year 2000:

> employment equity with other Australians, that is to increase the proportion of Aboriginal people aged 15 and above who are employed from 37% to around 60%;
>
> income equity with other Australians, that is a doubling of the median income of Aboriginals;
>
> equitable participation in primary, secondary and tertiary education; and
>
> a reduction of Aboriginal welfare dependency to a level commensurate with that of other Australians, that is a reduction in Aboriginal dependency on the unemployment benefit from the current level of around 30% of the working age population to only 5% (Australian Government 1987: 3-4).

These ambitious objectives were set against a background of falling rates of employment in the formal labour market for Aboriginal men. Figures from the Population Censuses show that in 1971, 60.4 per cent of Aboriginal men over the age of 15 were employed compared with 40.4 per cent in 1986. In contrast, the percentage of Aboriginal women aged over 15 years in employment grew slightly over the same period from 21.7 per cent to 22.7 per cent (Tesfaghiorghis and Altman 1991). Not only did the Labor Government commit itself to raising employment rates among Aborigines against a background of declining employment among Aboriginal men, but demographic factors will also make the achievement of the goal of employment equality more difficult. The Aboriginal population has a younger age structure than the non-Aboriginal population of Australia. Forty per cent of Aborigines were under 15 years of age in 1986 compared with 23 per cent of the non-Aboriginal population. Tesfaghiorghis and Gray (1991) have estimated on the basis of demographic projections that 72,709 additional Aboriginal jobs will be required by 2001 (above the 40,000 Aborigines in employment in 1986), to achieve the target of 60 per cent of Aborigines of working age in employment.

The 1986 employment figure somewhat overestimates the employment of Aboriginal people in the formal labour market for it includes the 6,000 participants in the Community Development Employment Projects (CDEP) scheme. Under this scheme which was first introduced in remote areas in 1976/77, individuals forego their welfare entitlements and work part-time on community-based projects for similar income. The scheme has since expanded greatly and in the 1990/91 financial year there were estimated to be 18,266 participants (Altman and Sanders 1991).[1] The implications of this scheme for Aboriginal employment and the achievement of the AEDP goals will be considered in the conclusion.

This paper is the second of two that examine the participation and employment of Aborigines in the formal labour market.[2] Data on the whole Aboriginal population are very limited and the Population Censuses, taken every five years, are the major source. Data from both the full count of individuals and the 1 per cent sample of the 1986 Census are used here firstly to describe Aboriginal employment patterns, and secondly to examine the important factors associated with employment among Aborigines. As in the earlier paper on labour force participation, a particular emphasis will be placed on the effect of location of residence on employment.[3] The different supply and demand conditions operating in rural and urban labour markets suggest a need for different policy responses to the problem of unemployment in these different environments.

The results of the analysis based on the 1 per cent sample of the Population Census should be considered as preliminary. The small number of Aborigines in the sample and the presentation of some variables in such a way as to preserve confidentiality, suggest the conclusions can be strengthened by the use of the full census data. Further research on the determinants of Aboriginal employment, which should overcome some of the problems, is currently being undertaken using the full Aboriginal sub-file from the 1986 Census at the Centre for Aboriginal Economic Policy Research (CAEPR) with the assistance of the Australian Bureau of Statistics.

The relationship between employment and location

There are a number of measures which are used as indicators of conditions in the labour market. Perhaps the most widely used is the unemployment rate which takes the ratio of those out of work and looking for a job to the total labour force (that is the employed plus the unemployed). There are several reasons why this measure may be less useful when considering the economic position of Aborigines than in the context of the mainstream economy.[4] Firstly the standard definition of employment as 'working for pay or profit' is not applicable to those Aborigines living a hunter-gatherer lifestyle. These people may be gainfully employed but not in activities formally recognised as employment. Even for those marginally attached to the formal labour market in the remote areas where there are few opportunities for employment, the distinction between unemployment and not being in the labour force has little validity. Both groups may be willing to take up employment in the formal labour market if the opportunity arose but there may be little incentive to register as unemployed where there are few jobs available. A 'discouraged worker' effect may also operate in urban areas if Aborigines feel they are discriminated against in the labour market and are discouraged from searching for work. These arguments

suggest that the standard measures of employment and unemployment may underestimate the true levels of both of these indicators. Community and regionally-based survey evidence summarised in Smith (1991) shows that Aboriginal unemployment rates tend to be higher than those estimated from census data.[5]

Although the standard measure of employment is problematic because it excludes those gainfully employed outside the formal labour market, it has a number of advantages over measuring the unemployment rate. It is relatively easy to observe whether a person has a job or not compared with observing the intention of a person to seek employment. Employment is also a useful indicator of income status. There is substantial evidence that employment is associated with higher individual and family incomes (Ross and Whiteford 1990; Treadgold 1988).[6] For these reasons the following discussion will focus on the employment rate; that is the ratio of employed persons to the working age population.

Table 1 presents the employment rate in 1986 for Aboriginal and non-Aboriginal men and women of working age by State and section-of-State. In each State or Territory and in each locality, the Aboriginal employment rate was below that of the non-Aboriginal population for both men and women. Taking Australia as a whole, less than half the male Aboriginal population of working age were in employment compared with about three-quarters of the non-Aboriginal population. Among Aboriginal women about a quarter were in employment compared with about half for non-Aboriginal women.

There was also much more variation in the employment rates of Aborigines than non-Aborigines. The male Aboriginal employment rate ranged from 31.7 per cent in the rural Northern Territory to 78 per cent in the major urban area of the Australian Capital Territory, compared with the much smaller range for non-Aboriginal men of 74.5 per cent in the major urban areas of Tasmania to 86.7 per cent in rural Australian Capital Territory. Employment rates also varied more for Aboriginal women across these locations, from 17.7 per cent in the rural areas of the Northern Territory and New South Wales to 53.1 per cent in the major urban area of the Australian Capital Territory compared with a range of 19.3 percentage points between the employment rate for non-Aboriginal women in other urban areas in New South Wales (44.5 per cent) and that of the major urban area of the Australian Capital Territory (63.8 per cent).

There was no evidence of a general effect of urban or rural residence on employment. In some States and Territories, notably South Australia and Tasmania, employment rates were as high or higher in the rural than urban areas, while in the more populous States of New South Wales and Victoria employment rates were highest among urban Aborigines. The

Table 1. Employment rate for men and women aged 15-64 years, Australia, States and Territories, by section-of-State.

	Male		Female	
	A[a]	NA[b]	A[a]	NA[b]
Australia				
Major urban[c]	51.3	77.0	32.4	52.8
Other urban[d]	41.6	75.7	23.7	46.2
All rural[e]	41.4	76.9	20.9	50.6
New South Wales				
Major urban	54.6	76.7	34.4	52.1
Other urban	36.3	73.3	19.9	44.5
All rural	32.2	73.9	17.7	48.3
Victoria				
Major urban	62.5	78.1	41.6	53.9
Other urban	52.4	77.5	29.5	47.7
All rural	52.9	79.4	31.5	54.0
Queensland				
Major urban	50.8	75.9	30.8	50.5
Other urban	45.7	75.0	23.8	45.0
All rural	51.1	75.6	20.4	47.4
South Australia				
Major urban	41.8	75.1	28.8	52.2
Other urban	37.1	75.9	23.6	46.6
All rural	53.6	79.7	35.3	56.5
Northern Territory				
Other urban	43.2	81.9	32.9	62.8
All rural	31.7	78.3	17.7	57.3
Australian Capital Territory				
Major urban	78.0	83.1	53.1	63.8
All rural	41.7	86.7	21.2	59.7
Western Australia				
Major urban	36.6	77.0	22.0	53.2
Other urban	36.0	79.2	19.0	46.7
All rural	39.8	80.2	22.1	53.4
Tasmania				
Major urban	57.7	74.5	40.7	52.7
Other urban	60.9	76.3	35.4	45.7
All rural	67.4	76.6	40.5	47.3

a. A = Aboriginal population.
b. NA = non-Aboriginal population.
c. Major urban: population in excess of 100,000.
d. Other urban: population between 1,000 and 100,000.
e. All rural: rest of State or Territory. There is no major urban area in the Northern Territory, nor is there any other urban areas in the Australian Capital Territory.

Source: Ross (1991) taken from Australian Bureau of Statistics 1986 Census microfiche.

South Australian figures may reflect the inclusion of participants in the CDEP scheme among the employed. With the expansion of the CDEP scheme, the 1991 Census figures may show a rapid rise in employment in rural areas in comparison with 1986.

The results of estimation of employment equations for men and women

The model and choice of variables

The earlier paper (Daly 1991) considered the question, do Aborigines have lower labour force participation rates because they are endowed with characteristics associated with low levels of attachment to the labour force (such as low levels of education) or because of some unique features associated with Aboriginality? The results suggested that after holding a range of factors constant, Aboriginality in itself had a negative effect on labour force participation. This may reflect factors on both the supply and demand sides of the labour market. Aborigines who were identical in every other measured respect to a group of non-Aborigines may choose not to participate in the formal labour market but rather to pursue a hunter-gatherer lifestyle. Alternatively factors on the demand side of the labour market, such as racial discrimination, may discourage Aborigines from seeking employment in the formal labour market and lead to lower participation rates.

The purpose of the current analysis is to ask a similar question about employment to that posed for labour force participation; are Aboriginal people less likely to be employed in the formal labour market than non-Aborigines because they have smaller endowments of the characteristics associated with employment or because Aboriginality in itself appears to affect the probability of employment? In addition to presenting results which test for a one-off effect of Aboriginality on employment, results are also presented which allow for an interaction between Aboriginality and the other control variables. These results enable testing for different effects of the independent variables on employment for Aborigines and for non-Aborigines. For example, do additional years of schooling have the same effect on the probability of employment for Aborigines as for non-Aborigines? Results for employment equations are presented separately for men and women aged 15-64.

The choice of the variables used in the analysis has taken into account the factors which human capital theory suggests should be important in determining employment prospects, namely education and labour market experience, and the results of earlier studies of Aboriginal employment and unemployment. In addition to the case study evidence on Aboriginal employment and unemployment summarised by Smith (1991), there have

been several studies which look at Aboriginal employment in a statistical framework similar to the one used here.

Miller (1989, 1991) used data from the 1985 round of the Australian Longitudinal Survey (ALS) of individuals aged 15 to 24 in 1984 to consider the effect of Aboriginality on the probability of unemployment. The sample of about 3,000 individuals included only 126 Aborigines so the results need to be treated with caution, but Miller found that Aboriginality was associated with higher levels of unemployment:

> ... when education, age, location, marital status, labour market history and family characteristics are held constant, the unemployment rate of Aboriginal youth is predicted to be about two-and-one-half times greater than that of other groups. This standardised unemployment rate differential is one of the most pronounced in the youth labour market (Miller 1989: 12).

Miller (1991) found similar results when he repeated the exercise using 1986 Census data for young people aged 15 to 24.

Ross (1990) used his 1986 survey of Aboriginal employment in non-metropolitan New South Wales to analyse in a statistical framework the factors which determined employment status for those in his sample. As he did not also sample non-Aborigines in similar circumstances, his results can not be used to test for any Aboriginal effect on employment status. He found that higher levels of education, experience in labour market programs and urban residence were associated with a greater probability of employment. Age was used as a proxy for labour market experience and Ross found that individuals aged between 31 and 50 were more likely to be in employment than either younger or older people.

Jones (1990, 1991) used the full Aboriginal sub-file of the 1986 Census to compare the determinants of unemployment for Aborigines and third-generation Anglo-Celtic Australians. He did not consider the effect of location of residence on the probability of unemployment but found that additional schooling, post-secondary qualifications and more potential labour market experience decreased the probability of being unemployed for Aborigines. He concluded that for an unqualified person, and holding other measured factors constant, the probability of unemployment for Aboriginal people was more than double that of the Anglo-Celts. However Aborigines with post-secondary qualifications, holding other things constant, had a similar probability of unemployment to the Anglo-Celts.

In summary, these three studies provide evidence that education and qualifications are important in increasing the probability of employment. Where it was possible to compare the experience of Aborigines with other groups, the results show that Aboriginality was associated with less favourable employment outcomes. The probit equation estimated here

for employment includes most of the factors found to be important determinants of employment status in these earlier studies-

Employment = f (age, education, marital status, number of dependents, location of residence, English-speaking ability, Aboriginality) (1)

Age, education and family characteristics are variables commonly included in models based on the human capital approach.[7] Ability to communicate in English has been included as Jones (1990, 1991) found that poor English language skills were associated with a higher probability of unemployment among Aborigines. An earlier study of labour force participation (Daly 1991) found that among Aboriginal men, poor English skills had a particularly negative effect on labour force participation.[8]

Location has been shown to be an important determinant of economic status for Aborigines and the division of Australia into loosely defined remote and settled areas has provided a framework for much of the discussion of Aboriginal policy issues.[9] In this analysis a question of interest is whether Aborigines living in rural areas have different access to employment than those Aborigines living in major urban areas. The answer to this question has important policy implications as different approaches may be required to improve Aboriginal employment prospects in different geographical locations.

The data

This analysis is based on the 1 per cent sample of the 1986 Census. There were about 1,200 Aborigines of working age included in this sample, but the exclusion of individuals whose answers to particular questions were 'not stated' reduced the number of Aborigines to about 800. An Australian Bureau of Statistics study of potential biases in the count of the Aboriginal population concluded that there were no serious problems, but the possibility of biases arising from non-response in this sample remains and this important qualification to the results should not be overlooked.[10] A comparison of some of the average characteristics of the sample used here with the whole of the 1 per cent sample, including non-respondents to particular questions, shows that the sample used in this analysis under-represents Aborigines aged 15-19.[11]

The mean values of the variables for both Aboriginal and non-Aboriginal men and women in and out of employment are presented in Tables 2 and 3. They are broadly consistent with the results of other comparisons between the Aboriginal and non-Aboriginal populations (Tesfaghiorghis and Altman 1991). Aboriginal men and women in this sample had less education, were younger, were more likely to be single and had more dependents than non-Aboriginal people. They were also more likely to

live in other urban and rural locations than the rest of the Australian population.

The tables can also be used to consider the differences between those in and out of employment. Aboriginal men in employment had completed more years of schooling; a higher proportion had completed high school or had post-secondary school qualifications; and they were more likely to be married and live in a major urban area than those not in employment. They were, however, well behind non-Aboriginal people in employment on all these indicators. A similar pattern was in evidence for Aboriginal women. The women who were in employment were those with more education and were more likely to be living in major urban areas.

The estimated results

The results of the estimation of employment equations are presented in Appendix Table A1 for men and Table A2 for women. Three equations are reported for each sex. A diagrammatical representation of the implied effect of Aboriginality on the employment probability is presented in the appendix. The first equation allows Aboriginality to have a one-off effect on employment with no interaction with other variables. The results of this regression can be used to answer the question, for any given set of the other explanatory variables such as education and age, does Aboriginality by itself affect the probability of employment. This functional form implies that the effect of all the other variables such as age and education, on employment is the same for Aborigines as for non-Aborigines.

The second equation includes both a shift effect of Aboriginality and interaction terms between Aboriginality and all the remaining variables. This allows for a different effect of all the other variables on employment for Aborigines compared with the rest of the population. Both Aboriginal and non-Aboriginal people are included in one equation to enable easier identification of an 'Aboriginal effect'. For example, the effect of being married on employment for an Aborigine can be calculated by adding the coefficient on 'married' to the coefficient on the variable 'Aborigine*married'. The latter variable will take the value of zero for non-Aborigines and one for Aborigines. If the 't' statistic on the latter coefficient is less than 1.96, taking conventional levels of significance, the null hypothesis that there is no difference in the effect of marriage on employment for Aborigines and non-Aborigines is accepted. The large standard errors (small 't' statistics) on most of the Aboriginal interaction terms may reflect the small number of observations and it is important to repeat the exercise on a larger sample. The third equation reported in the appendix tables is the preferred equation. For each sex, it only includes the interaction terms between Aboriginality and other variables which had 't' statistics greater than one in equation (2) of Tables A1 and A2; that is the estimates suggest that there is a different effect of these

variables for Aborigines than for the rest of the population. For example, for non-Aboriginal men, marriage was associated with a higher probability of employment than for a single man (see equation (2) Tables A1 and A2). However, the statistically significant coefficient on 'Aboriginal*married' for men indicates an even stronger positive effect of marriage on the probability of employment for Aborigines.

Table 2. Means of the variables used in the employment equations for men.

Variable	Aborigines		non-Aborigines	
	employed	not employed	employed	not employed
Age 15-19	0.12	0.25	0.06	0.12
Age 20-34	0.53	0.43	0.40	0.30
Age 35-49	0.26	0.20	0.35	0.18
Age 50-64	0.09	0.12	0.19	0.40
Years of school	9.15	8.71	9.84	9.22
Educ. qualification	0.19	0.07	0.51	0.33
Single	0.43	0.69	0.29	0.40
Married	0.48	0.22	0.64	0.48
Widowed, separated divorced	0.09	0.09	0.07	0.12
No. of dependents	1.31	1.21	0.94	0.58
Poor English	0.01	0.03	0.02	0.05
Urban	0.33	0.28	0.64	0.62
Other urban	0.39	0.41	0.21	0.23
Rural	0.28	0.31	0.15	0.15
Number of observations	200	228	8680	1879

Source: 1 per cent sample of the 1986 Census.

The constant term in each equation relates to a single non-Aboriginal person aged 15-19 years with no qualifications and living in a major urban area. The coefficients on the other variables show the effect of particular changes to this benchmark. The results from these employment equations can be summarised as follows: for all men, including Aborigines, years of primary and secondary schooling, the completion of high school or some post-secondary qualification and marriage were associated with higher probabilities of employment.[12] Men aged 20-49 were more likely to be employed than men aged 15-19 who, in turn, were more likely to be employed than men aged 50-64. A poor ability to communicate in English, and residence in the other urban areas were associated with a lower employment probability. Aboriginality was also associated with a lower probability of employment.

Table 3. Means of the variables used in the employment equations for women.

Variable	Aborigines		non-Aborigines	
	employed	not employed	employed	not employed
Age 15-19	0.17	0.16	0.09	0.05
Age 20-34	0.55	0.49	0.44	0.35
Age 35-49	0.22	0.22	0.35	0.26
Age 50-64	0.06	0.13	0.13	0.34
Years of school	9.57	8.68	9.99	9.29
Educ. qualification	0.23	0.07	0.40	0.23
Single	0.47	0.40	0.31	0.14
Married	0.40	0.42	0.59	0.69
Widowed, separated divorced	0.13	0.18	0.10	0.17
No. of dependents	1.08	1.64	0.86	1.04
Poor English	0.02	0.04	0.02	0.04
Urban	0.39	0.26	0.68	0.62
Other urban	0.39	0.42	0.19	0.25
Rural	0.22	0.32	0.13	0.13
Number of observations	125	276	5476	4539

Source: 1 per cent sample of the 1986 Census.

Education was also an important positive influence on employment for women but marriage and the number of dependent children had a negative effect on employment. The probability of employment was lower for those aged 20-34 and 50-64 than in the 15-19 category but women aged 35-49 were more likely to be in employment than the benchmark group. Poor English and residence in other urban areas were associated with lower employment probabilities. Aboriginality was associated with a lower probability of employment, holding everything constant.

These results can be used to decompose the differences in employment probabilities between Aborigines and non-Aborigines into that part which is explained by differences in the endowments of the two groups and the remaining unexplained part of the differential, using the approach presented in Blinder (1973). The results are presented in Table 4. Using the first equation from Table A1, and omitting the Aboriginal coefficient, the average Aboriginal man had a predicted employment probability of 0.78 compared with that of the average non-Aboriginal man of 0.84. In other words only 6 percentage points of the observed difference of 35 percentage points in employment probabilities was explained by differences in the measured endowments of the two groups. Similarly for women, the measured differences in endowments were not the major

Table 4. The decomposition of the difference in employment probabilities between Aboriginal and non-Aboriginal men and women.

	Men[a]	Women[a]
Difference to explain	0.35	0.24
Attributed to endowments	0.06	0.03
(percentage of difference)	17	13
Unexplained by endowment differences	0.29	0.21
(percentage of difference)	83	87

a. Non-Aboriginal employment probability minus the Aboriginal employment probability.

Source: Appendix tables A1 and A2.

source of differences in the observed employment probabilities. Equation (1) of Table A2 predicted an employment probability of 0.52 for the average Aboriginal woman compared with 0.55 for the average non-Aboriginal woman. This accounted for only 3 percentage points of the 24 percentage point gap in the observed probability of employment of the two groups. These results confirm the findings of Miller (1989, 1991) that the major source of the differences between the two groups was not the human capital endowments as measured in the census.

Table 5 presents the effects of changes in each independent variable on the mean employment probability for the sample of each sex as a whole. The estimation of marginal impacts uses equations (1) and (3) reported in Tables A1 and A2 for each sex. For example, for the person with the characteristics which were associated with the average employment probability for men of 81 per cent, a change in the age category from 15-19 to 20-34, using the results reported in equation (1), would increase the employment probability by 7 percentage points. A change in the race of the average man from non-Aborigine to Aborigine is associated with a reduction in the probability of employment by 23 percentage points. This result shows that the negative effect of Aboriginality on the employment probability for men (a reduction of 23 percentage points) was greater than its estimated effect on the probability of labour force participation (a reduction of 13 percentage points) (Daly 1991). The coefficients estimated in equation (1) Table A2 for women show that a change in race from non-Aborigine to Aborigine is associated with a reduction in the probability of employment by 21 percentage points. Once again this was larger than the negative effect of Aboriginality on labour force participation estimated to be 16 percentage points (Daly 1991).

Table 5. The effect of changes in the independent variables at the mean value of the dependent variable.

Variable	Men Mean of dep.var.=0.81 (1)	(3)	Women Mean of dep.var.=0.54 (1)	(3)
Age 20-34	0.07	0.07	-0.02	-0.02
Age 35-49	0.06	0.06	0.10	0.10
Age 50-64	-0.14	-0.14	-0.28	-0.28
Years of school	0.01	0.01	0.04	0.04
Educ. qualification	0.07	0.07	0.12	0.11
Married	0.17	0.16	-0.10	-0.11
Widowed, separated divorced	0.04	0.03	-0.18	-0.19
No. of dependents	0	0	-0.07	-0.07
Poor English	-0.15	-0.15	-0.13	-0.13
Other urban	-0.03	-0.03	-0.07	-0.07
Rural	-0.01	-0.01	-0.01	-0.01
Aborigine	-0.23	-0.28	-0.21	-0.28
Ab.*educ. qualification		0.08		0.14
Ab*married		0.10		0.14
Ab.*widowed, sep. divorced		0.10		0.13
Ab.*rural		-0.04		-0.10

Source: Appendix tables A1 and A2.

The effects derived from the preferred equation (3) in Tables A1 and A2 including selected Aboriginal interaction terms, show very similar effects for changes in age category, education, marital status and location as reported from equation (1) in Tables A1 and A2 for each sex. The results provide additional information about particular aspects of Aboriginality that affect the employment probability. For Aboriginal men, education and marriage increased the probability of employment even more than these variables did for non-Aborigines but living in a rural area reduced the employment probability by a further 4 percentage points compared with Aborigines in urban areas. This was a smaller negative effect on employment probabilities than the effect of rural residence on the probability of labour force participation. Aboriginal women had a probability of employment that was half that of non-Aboriginal women and living in a rural area reduced the probability of employment by a further 10 percentage points compared with Aboriginal women living in major urban areas.

Conclusions

It is well documented that Aboriginal employment rates are lower than those of the non-Aboriginal Australian population. The results of this analysis show that while this partly reflects lower levels of human capital such as education, these factors have a minor effect compared with other unexplained factors captured by the coefficients on the Aboriginal variables. The evidence suggests that Aboriginality has a strong negative Aboriginal effect on the employment probability, though the source of this effect requires further investigation. For the person with the characteristics which would give them an employment probability equal to the average of the sample, the introduction of Aboriginality reduced the probability of employment by about a quarter for men and by about a half for women. These are larger effects than the estimated effect of Aboriginality on labour force participation. This result suggests that it is more difficult for Aborigines to find employment than to be counted in the labour force which includes both the employed and unemployed. This is not a surprising result as the social security system does not discriminate according to race but employers may do so.

The results presented here suggest that the completion of high school and the acquisition of post-secondary qualifications are of particular importance in raising the probability of employment for Aborigines. This may reflect positive discrimination in favour of Aborigines in some forms of employment, for example the Australian Public Service. Education may be more important in promoting the employment prospects of urban Aborigines than those living in remote areas and it is planned to test for a different effect of education on the employment prospects of these two groups in further work.

The effect of Aboriginality is not so strongly related in a statistical sense to location as the effect of Aboriginality on labour force participation. Rural Aborigines were less likely to be in the labour force than their urban counterparts but the effect of rural residence on their employment probability was about half that of its effect on their participation probability.

The result that, other things being equal, rural Aborigines did not have a very different employment probability from urban Aborigines may reflect the role of the CDEP scheme in creating 'employment' in the remote areas. There were about three times as many participants on CDEP at the time of the 1991 Census as in 1986, so it is interesting to speculate about the results of a similar exercise to this using 1991 data. It is possible that at least for Aborigines all the standard determinants of employment, such as education, will no longer have such an important effect. Results based on the 1991 Census may reverse the conclusion that qualifications are important in increasing the employment probability.

The problem of Aboriginal unemployment may be defined away by the inclusion of CDEP participants among the employed. It is however questionable whether this can be considered as a true description of the position of Aborigines in the labour market.

Notes

1. A fuller description of the CDEP scheme is presented in Sanders (1988), Altman and Sanders (1991) and Morony (1991).

2. See Daly (1991).

3. Location of residence is measured here by the section-of-State of residence. This captures only one aspect of location namely settlement size, but not other aspects such as remoteness from large settlements. An urban centre is defined by the Australian Bureau of Statistics as 'one or more adjoining collection districts with urban characteristics and representing a population cluster of 1,000 or more people' (Australian Bureau of Statistics 1986: 150). The rural category used here includes both rural localities and the rural balance. Localities include population clusters which can 'be expected to contain at least 200 people (but not more than 999) by the next census; have at least 40 occupied non-farm dwellings with a discernible urban street pattern; have a discernible nucleus of population.' (Australian Bureau of Statistics 1986: 97). The rural balance includes all the collection districts not included elsewhere. (Australian Bureau of Statistics 1986: 132).

4. The issue of the appropriateness of mainstream labour market definitions to the situation of many Aboriginal people is discussed in more detail in Smith (1991).

5. For example, a survey of Aboriginal employment in non-metropolitan New South Wales conducted by Ross in 1986 found that 30 per cent of the 677 working age Aborigines interviewed were employed and 70 per cent unemployed. These figures contrast with the census figures for the same areas of 60 per cent employment and 40 per cent unemployment. Loveday's survey in 1986 of the Aboriginal population of Katherine in the Northern Territory, found an unemployment rate of 57 per cent compared with the census rate of 24.4 per cent. Both these studies used similar definitions of unemployment to those employed by the Australian Bureau of Statistics. A full reconciliation of the survey and census figures has not been undertaken.

6. This is not to deny the fact that subsistence activities can make an important contribution to income for Aborigines living in some areas. Fisk (1985) presents estimates of average income per adult Aborigine which show income at outstations to be almost as high as in the major urban areas once subsistence is taken into account. This subsistence income is not, however, included in measured income in the census. The available evidence suggests that the inclusion of income from these sources would not alter the general conclusion that employment in the formal labour market is associated with higher incomes than for those not employed (see Altman 1987 and Arthur 1991).

7. For a fuller justification of the inclusion of these variables see Ross (1990) and Daly (1991).

8. See Daly (1991). Poor English language skills were associated with lower levels of labour force participation for both men and women regardless of race. There was some evidence that the effect of poor English was particularly important for Aboriginal men but the coefficient on this variable was not significant at the 5 per cent level.

9. See for example, Altman and Nieuwenhuysen (1979) and Fisk (1985). Tesfaghiorghis (1991a, 1991b) provides evidence from the 1986 Census of considerable variation in socioeconomic indicators among States and sections-of States and Aboriginal and Torres Strait Islander Commission regions.

10. Australian Bureau of Statistics (1989). The issue of non-response raises the problem of selectivity bias. Given the literacy skills and motivation on the part of the individual required to complete the census questionnaire, it is possible that the individuals for whom all the data are available are not representative of the whole population.

11. Compare Table 2 in Daly (1991) with the average values reported here in Tables 2 and 3.

12. The result that marriage is associated with higher levels of employment and earnings is a familiar one in the human capital literature. The source of this effect is not clear. It may be that married men, with greater financial responsibilities, work harder to find employment or that employers discriminate in favour of married men. It is possible that the causation goes the other way and that employment is a prerequisite for marriage.

Appendix

The inclusion of an Aboriginal effect on employment probabilities

Figure A1 illustrates the way in which Aboriginality affects the employment probability in each of the three equations estimated. For illustrative purposes the relationship between years of schooling and the employment probability is used here. The relationship between these two variables is positive and for the non-Aboriginal population is represented by the upward sloping line marked non-Aboriginal. Including an Aboriginal dummy variable as in equation (1) enables Aboriginality to have a one-off effect on the probability of employment. At each level of schooling the probability of employment is lower for Aboriginal people than for non-Aboriginal people. (compare the relationship between schooling and employment for non-Aboriginals and for Aboriginals (equation 1)). It is an assumption of this formulation that the relationship between schooling and employment is the same for both racial groups. Equations 2 and 3 test for an additional effect of Aboriginality. In these equations the following question is considered, is the relationship between schooling and employment different for Aboriginals than for non-Aboriginals? These equations include both an Aboriginal shift dummy and interaction terms between Aboriginality and the other explanatory variables. The relationship is illustrated in Figure A1 by the line marked Aboriginal (equation 2 and 3). The coefficient on the Aboriginal shift dummy remained negative so at zero years of schooling Aboriginal people still had a lower probability of employment to non-Aboriginal people. The positive coefficients on the Aboriginal*years of schooling variables suggest that an additional year of schooling has a greater effect on the probability of employment for an Aboriginal person than for a non-Aboriginal person although the very small 't' statistics show this relationship is not statistically significant.

Figure A1. The inclusion of an Aboriginal effect on employment probabilities.

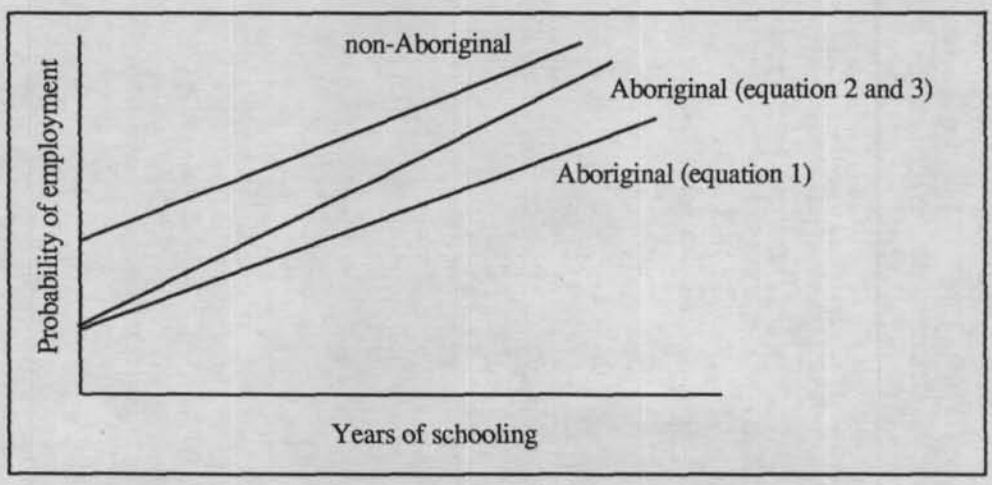

Table A1. Employment equations for men, 1986 Census.

Variable	(1)	(2)	(3)
Constant	-0.0038 (-0.04)	0.0039 (0.03)	0.0098 (0.09)
Age 20-34	0.2428 (4.41**)	0.2399 (4.13**)	0.2399 (4.34**)
Age 35-49	0.2287 (3.53**)	0.2378(3.50**)	0.2294 (3.53**)
Age 50-64	-0.5301 (-7.71**)	-0.5253 (-7.31**)	-0.5245 (-7.61**)
Years of school	0.0530 (5.47**)	0.0532 (5.29**)	0.0531 (5.48**)
Educ.qualification	0.2444 (7.33*)	0.2391 (7.06**)	0.2390 (7.10**)
Married	0.6152 (14.18**)	0.5881(13.06**)	0.5925 (13.41**)
Widowed, sep. divorced	0.1496 (2.57**)	0.1222 (2.03*)	0.1239 (2.08**)
No. of dependents	-0.0011 (-0.07)	0.0038 (0.24)	0.0001 (0.01)
Poor English	-0.5547 (6.62**)	-0.5448 (-6.39**)	-0.5532 (-6.60**)
Other urban	-0.0978 (-2.71**)	-0.0944 (-2.53**)	-0.1023 (-2.82**)
Rural	-0.0484 (-1.16)	-0.0383 (-0.88)	-0.0405 (-0.93)
Aborigine	-0.8550 (-12.84**)	-0.9534 (-2.38**)	-1.0091 (-10.16**)
Ab.*age 20-34		0.0198 (0.10)	
Ab.*age 35-49		-0.1535 (-0.64)	
Ab.*age 50-64		0.2941 (0.98)	
Ab.*years of school		0.0038 (0.10)	
Ab.*educ. qualification		0.3091 (1.46)	0.2966 (1.46)
Ab.*married		0.4079 (2.31**)	0.3630 (2.51**)
Ab.*widowed, sep. divorced		0.3686 (1.52)	0.3733 (1.64)
Ab.*no. of dependents		-0.0335 (-0.67)	
Ab.*poor English		-0.3415 (-0.65)	
Ab.*other urban		-0.1387 (-0.86)	
Ab.*rural		-0.1934 (-1.08)	-0.1462 (-0.98)
Log-likelihood	-4728.5	-4720.7	-4723.5
Restricted log-likelihood	-5370.3	-5370.3	-5370.3

The variables are defined as follows: There were 4 age categories defined, 15-19, 20-34, 35-49, 50-64; years of primary and secondary school were calculated as age left school minus 5 with a maximum value of 12; educational qualification took a value of 1 for those who had completed high school or some post-secondary qualification; married took a value of 1 for those who were married and widowed, separated or divorced took a value of 1 for those with one of these marital statuses; number of dependent children in the family recorded the number of children with a maximum of 8; poor English took a value of 1 for those who registered an inability to communicate easily in English; other urban took a value of 1 for those living in urban settlements of between 1,000 and 99,999 inhabitants and rural took a value of 1 for those living in smaller settlements; Aborigine took a value of 1 for those who identified themselves as Aborigines or Torres Strait Islanders.

Source: 1 per cent sample of the 1986 Census.

Table A2. Employment equations for women, 1986 Census.

Variable	(1)	(2)	(3)
Constant	-0.3206 (-2.88**)	-0.2989 (2.61**)	-0.3047 (-2.73**)
Age 20-34	-0.0445 (-0.77)	-0.0512 (0.85)	-0.0474 (-0.82)
Age 35-49	0.2412 (3.79**)	0.2415 (3.64**)	0.2401 (3.76**)
Age 50-64	-0.6975 (-10.22**)	-0.7020 (-9.87**)	-0.6971 (-10.18**)
Years of school	0.0932 (9.17**)	0.0928 (8.92**)	0.0932 (9.17**)
Educ. qualification	0.3028 (9.53**)	0.2955 (9.18**)	0.2949 (9.21**)
Married	-0.2572 (-6.32**)	-0.2773 (-6.58**)	-0.2761 (-6.65**)
Widowed, sep. divorced	-0.4627 (-8.92**)	-0.4849 (-9.06**)	-0.4840 (-9.11**)
No. of dependents	-0.1849 (-14.84**)	-0.1833 (-14.28**)	-0.1844 (-14.79**)
Poor English	-0.3216 (-3.93**)	-0.3226 (-3.88**)	-0.3207 (-3.91**)
Other urban	-0.1837 (-5.73**)	-0.1837 (-5.60**)	-0.1840 (-5.72**)
Rural	-0.0214 (-0.55)	-0.0045 (-0.11)	-0.0046 (-0.11)
Aborigine	-0.5178 (-7.28**)	-0.7554 (-1.52)	-0.6944 (-5.80**)
Ab.*age 20-34		0.0659 (-0.31)	
Ab.*age 35-49		-0.1191 (-0.46)	
Ab.*age 50-64		0.2902 (0.89)	
Ab.*years of school		0.0051 (0.10)	
Ab.*educ. qualification		0.3398 (1.53)	0.3544 (1.76)
Ab.*married		0.3865 (2.17*)	0.3587 (2.34*)
Ab.*widowed, separated divorced		0.3478 (1.49)	0.3258 (1.54)
Ab.*no. of dependents		-0.0208 (-0.38)	
Ab.*poor English		0.0105 (0.02)	
Ab.*other urban		-0.0011 (-0.01)	
Ab.*rural		-0.2665 (-1.38)	-0.2627 (-1.62)
Log-likelihood	-6375.0	-6367.6	-6368.9
Restricted log-likelihood	-7190.1	-7190.1	-7190.1

Notes: The variable definitions are included in the notes to Table A1.

Source: 1 per cent sample of the 1986 Census.

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